Electronic Version
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Claims

[c1] What is claimed is:

1.A fluid injection head structure comprising:

a substrate;

a manifold formed in the substrate;

at least two rows of chambers in flow communication with the manifold and positioned on two sides of the manifold, wherein fluid flows into the chambers through the manifold;

a plurality of orifices in flow communication with a corresponding chambers;

a plurality of bubble generators disposed on the substrate, only single bubble generator being disposed in one chamber, and each bubble generator being disposed approximately adjacent to a corresponding orifice and external to the corresponding chamber;

a driving circuit comprising a plurality of functional devices disposed on the substrate for sending driving signals to drive the plurality of the bubble generators; and

a conductive trace disposed on the substrate for driving the bubble generators, wherein a portion of the conductive trace is disposed above the manifold and between the two rows of chambers.

[c2] 2.The fluid injection head structure of claim 1 wherein each bubble generator is disposed above the corresponding chamber.

[c3] 3.The fluid injection head structure of claim 1 wherein the single bubble generator in the chamber is disposed between the manifold and the corresponding orifice.

[c4] 4. An apparatus for ejecting fluid, comprising:
a chamber;
a manifold in flow communication with the chamber for supplying fluid to the chamber;
an orifice in flow communication with the chamber;
a means for generating a first bubble within the chamber when the chamber is filled with liquid, the first bubble generating means disposed approximately adjacent to the orifice and external to the chamber; and
a means for generating a second bubble within the chamber when the chamber is filled with liquid, the second bubble generating means disposed approximately adjacent to the orifice and external to the chamber,
wherein the orifice is disposed between the first bubble generating means and the second bubble generating means,
wherein the first bubble and the second bubble are generated at substantially the same time, and the formation

of the first bubble and the second bubble causes fluid in the chamber to eject through the orifice substantially perpendicular to the chamber.

[c5] 5.The apparatus of claim 4 wherein the first bubble generating means and the second bubble generating means are first and second resistors, respectively.

[c6] 6.The apparatus of claim 5 wherein the first and second resistors have approximately equal resistance values.

[c7] 7.The apparatus of claim 5 wherein the first and second resistors are disposed above the chamber.

[c8] 8. A printhead for ejecting ink, comprising:
a substrate;
a manifold formed in the substrate;
a plurality of chambers in flow communication with the manifold, wherein ink flows through the manifold into the chambers;
a plurality of orifices in flow communication with a corresponding chamber;
a means for generating a first bubble and a second bubble within the corresponding chamber when the corresponding chamber is filled with liquid, the first bubble generating means and the second bubble generating means disposed approximately adjacent to a corre-

sponding orifice and external to the corresponding chamber;

wherein the orifice is disposed between the first bubble generating means and the second bubble generating means; and

an addressing circuit means including a plurality of pads and demultiplexing means, the addressing circuit means being disposed on the substrate and connected between the first bubble generating means, the second bubble generating means, and the pads,

wherein the number of pads is less than the number of chambers.

[c9] 9.The printhead of claim 8 wherein the first bubble and the second bubble are generated at substantially the same time, and the formation of the first bubble and the second bubble causes fluid in the chamber to eject through the orifice substantially perpendicular to the chamber.

[c10] 10.The printhead of claim 9 wherein the first bubble generating means and the second bubble generating means are first and second resistors, respectively.

[c11] 11.The printhead of claim 10 wherein the first and second resistors have approximately equal resistance values.

[c12] 12.The printhead of claim 10 wherein the first and second resistors are disposed above the chamber.

[c13] 13. A printing system having a printhead for ejecting ink, comprising:
a supply of ink in an ink reservoir;
a substrate of the printhead;
a manifold formed in the substrate;
a plurality of chambers in flow communication with the manifold, wherein ink flows through the manifold into the chambers, the chambers being spaced apart from each other a predetermined distance so as to provide printing equal to or greater than approximately 300 dots per inch in a single pass of the printhead across a medium;
a means for generating a first bubble and a second bubble within a corresponding chamber when the corresponding chamber is filled with liquid, the first bubble generating means and the second bubble generating means disposed approximately adjacent to a corresponding orifice and external to the corresponding chamber;
wherein the orifice is disposed between the first bubble generating means and the second bubble generating means; and
a first circuitry including a plurality of pads and demulti-

plexing means, the first circuitry being disposed on the substrate and connected between the first bubble generating means, the second bubble generating means, and the pads,

wherein a total number of the pads is less than or equal to approximately one-twelfth of a total number of the first bubble and second bubble generating means on the substrate.

[c14] 14.The printing system of claim 13 wherein the first bubble and the second bubble are generated at substantially the same time, and the formation of the first bubble and the second bubble causes fluid in the chamber to eject through the orifice substantially perpendicular to the chamber.

[c15] 15.The printing system of claim 14 wherein the first bubble generating means and the second bubble generating means are first and second resistors, respectively.

[c16] 16.The printing system of claim 15 wherein the first and second resistors have approximately equal resistance values.

[c17] 17.The printing system of claim 15 wherein the first and second resistors are disposed above the chamber.